FLOOD PLAIN MANAGEMENT STUDY
LUXAPALLILA CREEK
IN VICINITY OF MILLPORT
MILLPORT, ALABAMA

PREPARED BY

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
AUBURN, ALABAMA

IN COOPERATION WITH

TOWN OF MILLPORT, ALABAMA
LAMAR COUNTY SOIL AND WATER CONSERVATION DISTRICT
WEST ALABAMA PLANNING AND DEVELOPMENT COUNCIL
STATE OF ALABAMA
OFFICE OF STATE PLANNING AND FEDERAL PROGRAMS
JULY 1982

Acknowledgements:

The cooperation and assistance given by the many agencies, organizations, and industries during these flood hazard analyses are greatly appreciated. These include:

Lamar County Soil and Water Conservation District

Town of Millport

West Alabama Planning and Development Council

U. S. Geological Survey, Department of Interior

Office of State Planning and Federal Programs

Appreciation is also extended to the many local officials and individuals who contributed information for the study and to landowners who permitted access for engineering surveys and field studies.

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FOREWORD

Pressures created by increased urbanization have intensified the demand for the use of flood plain areas in and adjacent to Millport, Alabama. Technical information about flood hazards is essential for a local flood plain management program to be effectively planned and implemented.

This report provides flood hazard information for some 6.6 stream miles along Luxapallila Creek and tributaries. The drainage areas involved range from 222 to 252 square miles in the Luxapallila Creek Watershed and 1.1 to 6.4 square miles for Propst and Driver Creeks. The report includes Flood Hazard Area Photomaps, Flood Profiles, Discharge-Elevation-Frequency Data, and Floodway Data for these streams. Regulatory and corrective measures that would minimize the risk of flooding are also discussed in the report.

Identification of the major flood-prone areas history of flooding and pertinent existing state and local flood-prone area regulations are contained in the report. State and local governmental units will find this information valuable in assessing flood problems and determining actions needed for the judicious use of lands in and adjacent to the flood plain.

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INTRODUCTION

The town of Millport requested this flood plain management study to identify local flood problems and to encourage only those uses of the flood-prone area commensurate with the flood hazard. This study was carried out in accordance with a plan of study developed in June 1979 by the Soil Conservation Service (SCS) and requesting state and local entities. Flood plain management studies in Alabama are carried out under the revised October 1978 Joint Coordination Agreement between the Soil Conservation Service and the Office of State Planning and Federal Programs (OSPFP). Data in this report are based on investigations and analyses performed by the United States Department of Agriculture, Soil Conservation Service, in cooperation with requesting entities and the Lamar County Soil and Water Conservation District.

The SCS carries out flood plain management studies under the authority of Section 6 of Public Law 83-566, in response to Federal Level Recommendation No. 3 of Water Resources Council revised Unified National Program for Flood Plain Management, September 1979; and in compliance with Executive Order 11988, dated May 24, 1977. Section 11-52-1 through 11-52-84, the Code of Alabama 1975, as amended, provides the zoning authority for municipalities to develop land use controls. Sections 11-19-1 through 11-19-24 of the Code of Alabama 1975, as amended, contains enabling legislation for development of a comprehensive land management and use program in unincorporated flood prone areas of the state. It allows county commissions in Alabama to meet requirements of the National Flood Insurance Act of 1968 (as amended), and authorizes the county commissions to prescribe criteria for land management and use in flood-prone areas.

The objective of this flood plain management study is to furnish needed technical data to local governments so they can prevent potential flood losses that might be caused by unwise development in flood-prone areas.

Information on the possibility of future (24-hour duration) floods of various magnitudes and the extent of flooding which might occur is included for Luxapallila Creek and Tribuary areas within and adjacent to the town of Millport, Alabama. The extent of potential flooding from the 100-year and 500-year floods is shown on aerial photomaps. Elevations of expected flooding for selected recurrence intervals (10-, 50-, 100-, and 500-year events) are provided on flood profiles for the streams studied. (See "Glossary of Terms" in appendix C for detailed definitions of terms used in the report.)

By using the maps, tables, and profiles presented in this report, the flood elevation at selected locations along the streams may be determined. This information will permit local units of government to implement flood plain management regulations which recognize potential flood hazards.

The maps and profiles are based on conditions that existed at the time field surveys were made in 1979. Such factors as increased urbanization, encroachment on flood-prone areas, relocation or modification of bridges and other stream crossings, and stream channel improvement can have a significant effect on flood stages and areas inundated. Therefore, the results of any flood hazard analyses should be reviewed periodically by appropriate state and local officials and planners to determine if changes in watershed conditions would significantly affect future flood elevations.

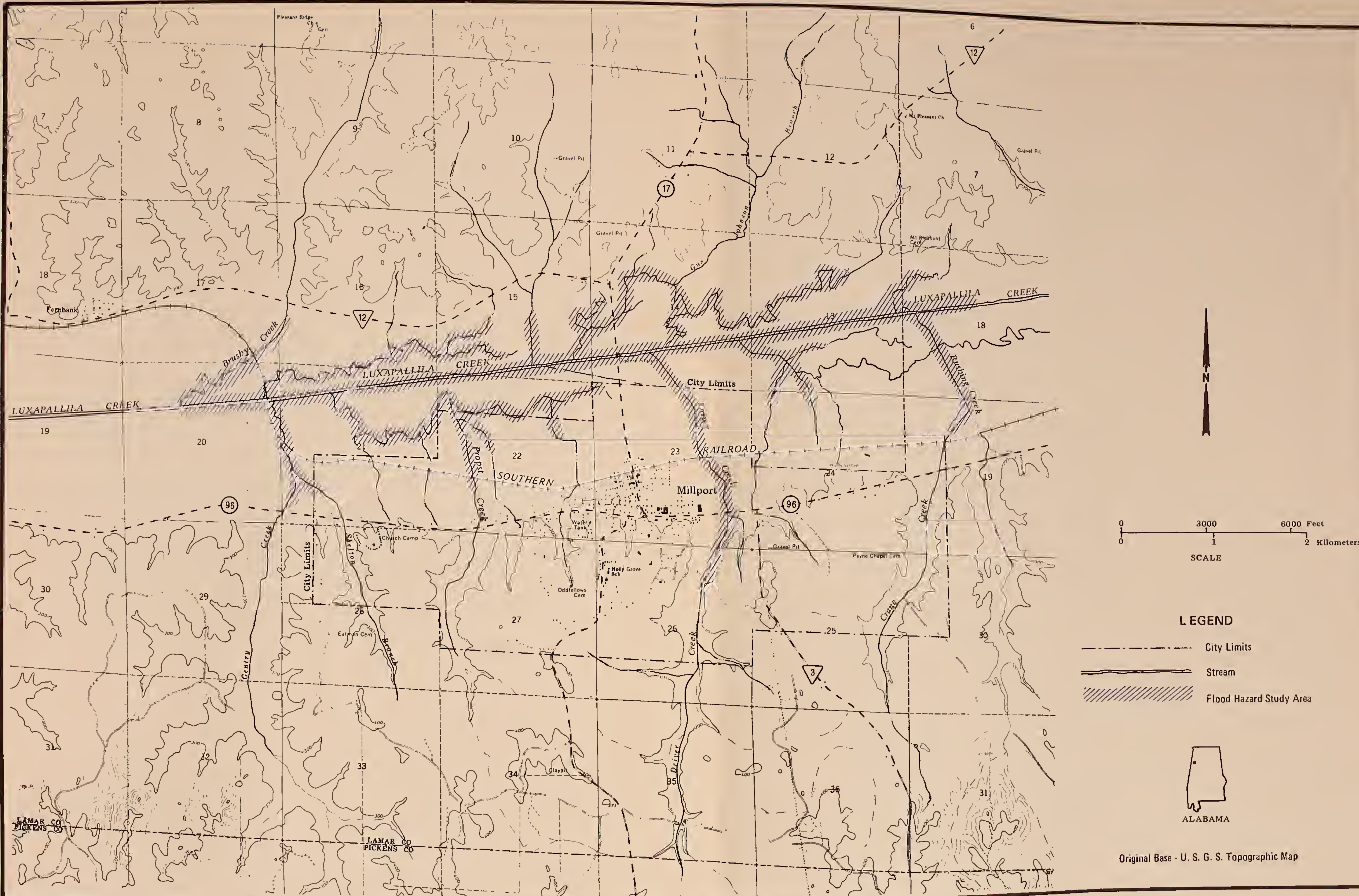
The Soil Conservation Service can provide technical assistance through the Lamar County Soil and Water Conservation District to federal, state, and local agencies in the interpretation and use of the information contained herein and will provide additional technical assistance and data needed in local flood plain management programs.

DESCRIPTION OF STUDY AREA

General: The town of Millport is located in Lamar County, Alabama, within the Tombigbee River Basin (USGS Hydrologic Unit Code Luxapallila Creek-03160105-SCS-030). The study area includes flood-prone areas of Luxapallila, Propst and Driver Creeks within and adjacent to the town of Millport (see location map, page 4). Luxapallila Creek is a perennial stream and flows into Tombigbee River from the north at river mile 317. Drainage areas are approximately as follows: Luxapallila Creek - 252 square miles at the study limits, Driver Creek - 6.4 square miles, and Propst Creek - 1.1 square miles. (see table 1, page 5). A total of 6.6 stream miles was studied (see table 3, page 11 for each stream length and flood plain acreage).

Lamar County had an estimated population of 16,453 in 1980. Millport, with a 1980 population of 1,273 experienced an increase of 19 percent in the 1970-80 decade. The OSPFP has projected the town's population to increase to 1,483 by 1990.

The area of incorporation, at present, is approximately 5.3 square miles and the incorporated area subject to flooding by the 100-year frequency storm is 1.5 square miles.



LOCATION MAP

LUXAPALLILA CREEK AND TRIBUTARIES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MILLPORT, ALABAMA
FLOOD PLAIN MANAGEMENT STUDY
LAMAR COUNTY

SHEET 1 OF 1

USDA-SCS-FORT WORTH, TEXAS 1981

TABLE 1

DRAINAGE AREAS OF STREAMS

Stream or Tributary	Drainage Area Sq. Mi.	Cross Section
Luxapallila Creek	248.0	1
Luxapallila Creek @ Hwy. 96	241.0	5
Propst Creek @ R.R.	1.1	9
Driver Creek @ Hwy. 96	6.25	16

TABLE 2

AVERAGE TEMPERATURE AND RAINFALL*

Season	Temperature (Degrees Fahrenheit)	Rainfall (Inches)
Winter	45.0	16.1
Spring	62.1	15.4
Summer	78.6	12.8
Fall	62.9	9.7
Yearly Average 1941-70	62.0	54.1

*Climatography - No. 81, Alabama (NOAA, Department of Commerce)

The climate is humid and temperate. Rainfall is generally well distributed throughout the year. The average temperature and rainfall are as shown in table 2 above.

The normal frost-free period is from March 30 to October 30 and averages 220 days.

Topography and Geology: The area lies in the Fall Line Hills district of the East Gulf Coastal Plain Physiographic Section. Elevations range from about 250 feet in the flood plain of Luxapallila Creek up to about 440 feet on the hills south of Millport. The flood plain is wide and flat. The older portion of Millport is on a gently rising toe slope on the south side of Luxapallila valley. South of Millport the uplands are strongly rolling to steep.

The Gordo Formation, a unit of the Tuscaloosa Group of Late Cretaceous Age, underlies the area. Upland materials are relatively uncemented, sedimentary clays, sands, and gravel. Formations are undeformed sedimentary deposits that dip gently toward the southwest at 50 feet per mile. Flood plains and terrace materials are sandy silts and clays which were eroded from the uplands and redeposited in the valleys.

Soils: The soils within the 100-year flood hazard area formed in loamy alluvium on flood plains and low stream terraces. The major soil map units are the Bibb-Bruno-Swampland association and the Prentiss-Stough association.

The Bibb-Bruno-Swampland association comprises about 75 percent of the area. This association consists of deep, nearly level, friable sandy flood plain soils. Drainage ranges from excessive for the Bruno soils to very poor for the swamplands.

Soils of this association occur in large areas bordering Luxapalila Creek and its tributaries. Frequency of overflow is variable. Some of the soils are flooded several times each year; others are subjected to flooding but once

in several years; while still other soils are covered with water all or most of the time and are considered swampy. Except for prolonged dry periods, the water table is at or near the surface most of the year. Within this association are sporadic, undulating sandy areas where it is deeper to the water table. Soils are of light texture and generally are quite sandy.

The Prentiss-Stough association comprises about 25 percent of the area. This association consists of moderately deep, friable soils with fragipans on nearly level slopes. Drainage ranges from moderately well to somewhat poorly drained.

Soils of this association occur in large areas on stream terraces of the Luxapalila Creek and its tributaries. These soils are subject to rare, if any, flooding. However, there are some depressional areas that are ponded for brief periods after heavy rains. These soils have a fragipan in the subsoil that restricts downward movement of waters. During much of the year, the water table is perched above this restrictive fragipan. Within this association are a few areas of deep, well drained, friable soils that lack fragipans. These soils are included in this association because of similarities of the other major soil characteristics of this association.

The Bibb-Bruno-Swampland association is poorly suited for cultivated crops and has fair suitability for pasture and woodland because of flooding. The Prentiss-Stough association is well suited for cultivated crops, pasture, and woodland. However, when used for cropland, a drainage system may be necessary to remove excess water during heavy rains.

Suitability for most urban uses is poor because of either wetness or flooding or both.

If detail soils information is desired for a specific location, the Lamar County Soil and Water Conservation District or personnel in the Soil Conservation Service Field Office in Vernon should be consulted.

NATURAL VALUES

Land Use: The present land use in the Luxapallila Creek Watershed consists of cropland (4 percent), pasture (5 percent), idle (1 percent), and woodland (89 percent), the remaining land is used for residential, commercial, and industrial areas and roads (less than 1 percent). The present land use in the Propst and Driver Creek Watersheds consists of cropland (1 percent), pasture (1 percent), and woodland (98 percent). Flood plain land use in the study area is as follows: urban (2 percent), soybeans (11 percent), pasture (8 percent), woodland (78 percent), and miscellaneous (1 percent).

Prime Farmlands: Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. Land that may qualify as prime farmland could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods. In general, prime farmlands have an adequate and

dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air.

Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding.

It is estimated, based on the soil associations mapped, that only about 12 percent of the entire study area will qualify as prime farmland. A modern soil survey of this area does not exist, therefore, prime farmland map units have not been delineated. However, the Prentiss soils of the Prentiss-Stough association will qualify as prime farmland if delineated out by modern soil survey methods.

Wetlands: The area of Luxapillila Creek addressed in this flood plain management study contains a rich diversity and abundance of indigenous flora and fauna. The primary plant community is a bottomland hardwood area consisting primarily of Type 1 and Type 7 wetlands. Bottomland hardwood areas, with their attendant wetlands, are generally recognized in Alabama as vital fish and wildlife habitat. Of equal importance, these areas function as pollution filtration systems, as natural flood control mechanisms, and as a source of ground water recharge. Probably the most obvious economical impact of these vital natural areas is their ability to produce a harvestable surplus of fish and wildlife.

Representative plant species in the flood plain area include ash, sweetgum, blackgum, oak, willow, sweetbay, yellow poplar, maple, sycamore, and bald cypress. The uninhabited portion of the flood plain is excellent habitat for

wildlife species associated with bottomland hardwood communities. The inherent value is, however, reduced somewhat by the area's close proximity to the human population. That is, certain secretive species will not use the area as much as they might if the influence of the human population were not present.

The major species of game fish in the study area include bluegill, green sunfish, longear sunfish, redear sunfish, warmouth, and largemouth bass. Major species of rough fish include blue catfish, channel catfish, yellow bullhead, bowfin, gar, sucker, buffalo, shad, and numerous minnows.

Since the study area is predominantly woodland, the most important game species within the study area are those associated with woodlands, e.g., gray squirrel, whitetailed deer, and wood duck. The bobwhite quail and cottontail rabbit are common on open and idle land. Important furbearers include beaver, bobcat, gray fox, mink, muskrat, raccoon, and opossum.

FLOOD PROBLEMS

Historical Floods: Official records on flood elevations in Millport have been maintained and reliable information is available for USGS station 02442500, Luxapallila Creek at Millport, Alabama. The 24-hour rainfall report by the Weather Service shows the storm of April 13, 1979, was about 8 inches. This approximates a 100-year 24-hour rainfall and was documented by newspaper and local residents.

During the storm, road damage along Alabama Highway 96 and Lamar County Highway 12 occurred. Street and culvert damage was noted within the town limits of Millport. A house along Highway 12 received floodwater damage.

Future Floods: Flood stages presented in this report are based on the assumption that road embankments will not fail before the maximum flood stages are reached. Unusual trash blockages and log jams were not considered in the analysis.

Approximately 2,802 acres in the study area are subject to damage by the 100-year flood. The area of inundation increases approximately 4 percent, to 2,913 acres, for the 500-year flood. The 100-year depths of flooding range from less than 2 feet to over 8 feet on Luxapallila Creek and less than 3 feet to over 6 feet on Propst and Driver Creeks. The velocities vary from less than 1 foot per second to about 6 feet per second. Streams studied are tabulated by reaches with acreages subject to inundation from the 100-year and 500-year floods (see table 3, below).

TABLE 3
STREAM MILEAGE AND FLOOD AREA
100-YEAR AND 500-YEAR FLOODS

STREAM REACH	MILES	CROSS SECTIONS	FLOOD AREA (Acres)		LAND USE 100-year (Acres)	
			100-year	500-year	Urban	Cropland
Luxapallila Creek	5.1	1 to 7	2709	2811	43	304
Propst Creek	0.5	8 to 10	1	1	0	0
Driver Creek	1.0	11 to 18	92	101	0	0
Total	6.6		2802	2913	43	304

The flood profile sheets (appendix B) include expected water surface elevations for the 10-, 50-, 100-, and 500-year frequency floods, and present pertinent bridge and roadway data, and elevations of the existing channel bottom. Flood elevations can be estimated at any location from the profiles on Sheets 01P through 05P for Luxapallila Creek and Sheets 06P and 07P for Propst and Driver Creeks.

For information about the estimated floodwater elevation at a specific location, refer to the Flood Hazard Area Photomaps to determine where this location is relative to the nearest upstream and downstream cross sections. To determine a floodwater elevation for a given frequency flood at a specific location, estimate or scale the valley distance between the location in question and the nearest cross section shown on the photomaps. Next, find the location of that cross section on the water surface profile, move the distance from the cross section to the point in question on the profile. Read the flood elevation directly from the profile by going up the elevation scale at the selected station to the plotted elevation line for the frequency flood and then read horizontally to obtain the elevation. The water surface elevation of each flood at selected cross sections are shown in table 5 of appendix C. Typical valley cross sections showing the elevation of the 10-year and 100-year flood are in appendix B.

EXISTING FLOOD PLAIN MANAGEMENT*

The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 encourage strict management of flood-prone areas through local regulation. The State of Alabama, responding to the National Flood Insurance Program, authorized and granted powers, by Section 11 of the Code of Alabama 1975, to each county or local government in Alabama to prescribe criteria for land management, including control measures in flood-prone areas. The Office of State Planning and Federal Programs and the Regional Planning Commissions assist county and local governments in carrying out this authority by developing comprehensive land management programs in flood-prone areas. The town of Millport has participated in the FEMA Flood Insurance Program since August 6, 1974 (Emergency Program). Entrance into this program authorized the sale of flood insurance at subsidized rates for both residential and non-residential structures and mobile homes and their contents throughout the areas subject to flooding in the town. The National Flood Insurance Act of 1968 requires local units of government to develop restrictive measures for flood-prone areas based on competent evaluation of flood hazards and applicable state standards. The town agreed to adopt the codes and ordinances necessary to protect the community from flood hazards. Currently, the town is awaiting a detailed FEMA Flood Insurance Study, and FEMA Flood Insurance Rate Maps, after which the town may be certified as eligible for the Regular Flood Insurance Program of the FEMA.

ALTERNATIVES FOR FLOOD PLAIN MANAGEMENT*

The current level of flood damages is sufficiently low to permit local officials to strengthen their flood plain management program primarily by restricting

* This section of the report was prepared by the West Alabama Planning and Development Council in cooperation with the town of Millport.

development in the flood plain and regulating upland land use changes to avoid increasing future runoff rates from contributing watershed areas. Technical flood hazard information is a valuable tool which the town of Millport can use to regulate development and use of the flood-prone area and thereby minimize future losses from flooding. This section is intended to outline a program by which the town can protect itself from the destruction and loss of property associated with a flood, while at the same time achieving wise use of the flood-prone areas. The Flood Hazard Area Photomaps prepared for this study should be adopted as part of Millport's flood plain management program until a Federal Emergency Management Agency's (FEMA) Flood Insurance Study is completed. When flood zone maps are developed and published as part of the flood insurance study, these maps could be officially incorporated into the town's flood plain management ordinance. Additional controls will need to be imposed when more detailed information is available. It is recommended that the town develop a program to publicize the availability of flood insurance and encourage community residents to participate in the program, especially those located in or near flood-prone areas. Residents in flood-prone areas should be made aware of the impacts of non-participation in the Flood Insurance Program.

In conformance with the requirements of FEMA's Emergency National Flood Insurance Program (NFIP), the town is already enforcing certain regulations in currently identified flood-prone areas. These include the basic subdivision and zoning ordinances and construction codes. A local regulatory program should be implemented through the use of codes and ordinances and proper administrative procedures. Revision of existing codes and adoption of effective policies and procedures can result not only in protection of existing structures but also in the wise management of flood-prone areas in future years. The land use control

measures in flood-prone areas are an important aspect of a flood plain management program. These controls include zoning, subdivision regulation, and construction standards. Additional regulations developed for the flood-prone areas should be integrated with the town's existing land use control policies. The ordinances that are amended and the additional controls that are adopted should be mutually supporting and should be compatible with the town's overall development policies. Assistance will be provided by the West Alabama Planning and Development Council in developing the regulatory measures needed if requested. The following alternatives may also be viable as a part of the town's overall plan to minimize future flood damages:

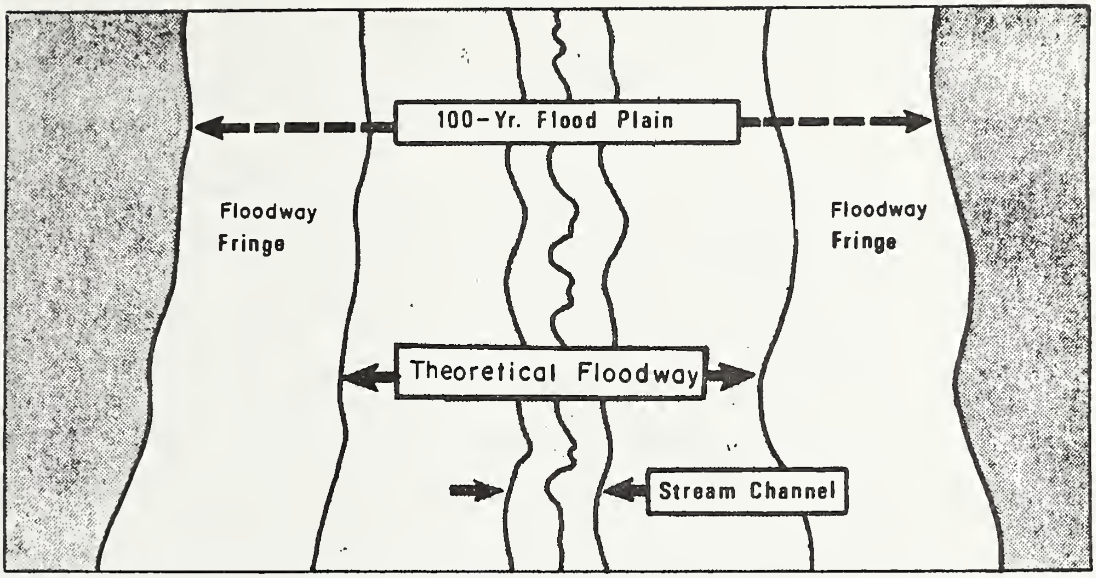
Floodways - Millport has not yet adopted a floodway restriction. Additional planning and detailed technical data will be necessary to identify and establish floodway limits. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard.

The area of the 100-year flood could be divided into proposed "floodway" and a "floodway fringe" as shown in figure 2. The "floodway" would include the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment to permit the 100-year flood be carried without substantial increase in flood elevations. The area between the floodway and the boundary of the 100-year flood could be termed the "floodway fringe". The floodway fringe would encompass the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than a foot at any point.

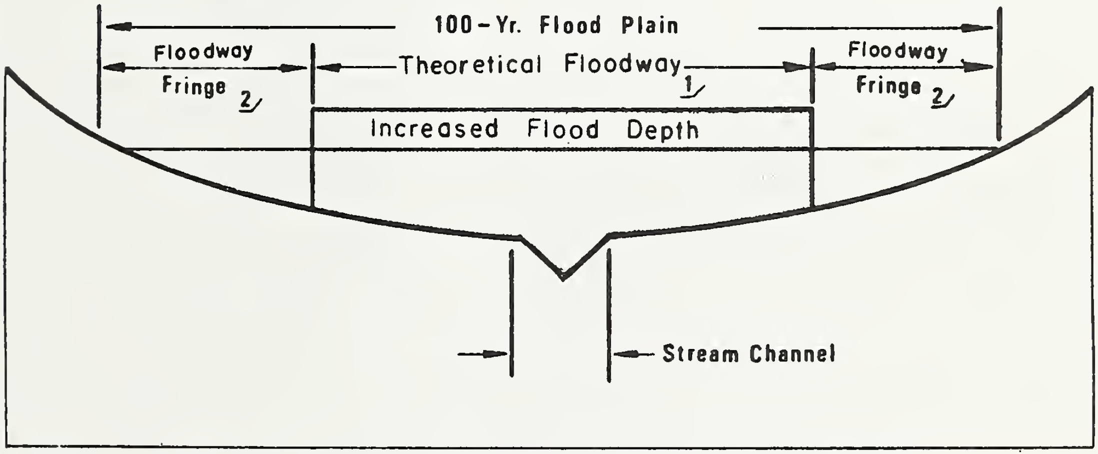
The filling of flood-prone areas and subsequent development would reduce the width of the original floodway. A reduction in floodway width would cause

Figure 2

FLOOD HAZARD AREAS



PLAN VIEW



CROSS SECTION

1/ THEORETICAL FLOODWAY is the adjusted portions of the 100-year flood plain allowing for an acceptable increase in the 100-year flood depth, no building or fill permitted.

2/ FLOODWAY FRINGE --- Urban use permitted if protected by fill, floodproofed, or otherwise protected.

an increase in flood stage for the same discharge. Figure 2 illustrates the possible effect of reducing the floodway width by theoretical encroachment (see figure 2, page 16, and table 6, appendix C).

Construction Standards: The town is currently enforcing the Standard Building Codes published by the Southern Building Code Congress and the National Electrical Code published by the National Fire Protection Association. To comply with the National Flood Insurance Program standards, Millport will need to adopt more specific flood proofing standards for construction in floodway fringe areas. In addition, standards should be adopted for filling operations in areas subject to flooding, and guidelines be established for storage of materials in floodway fringe areas. These standards may be incorporated into a single flood-prone area ordinance that will supplement the existing construction codes.

Flood Warning and Forecasting - The National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) office in Birmingham, Alabama, issues flood warnings. Severe weather and flood warnings, along with general weather forecasts, are distributed by the National Oceanic and Atmospheric Administration (NOAA) Weather Wire Service. This service links, by teletype, the National Weather Service offices with outlets to news media (newspapers, radio, television) and any other private or government agency in the area where a primary wire service has been established, if they arrange to secure a drop on this circuit. Other local radio stations may obtain the information relayed through news wire services. Rainfall accumulations and predictions of the National Weather Service are furnished to local and county Civil Defense Units when flooding is predicted in their areas. The 5-year flood (4 inches of rainfall in 24 hours)

approaches the level at which damages occur. Once a flash flood watch is issued by the weather service, the Lamar County Civil Defense Office can monitor stream stages and issue statements to local radio stations for broadcast to the public. There are several stream gaging stations located in Luxapallila Watershed; however, only one station is located in the study limits. Evacuation of low-lying areas can be accomplished through the help of the local National Guard Unit and rescue squad.

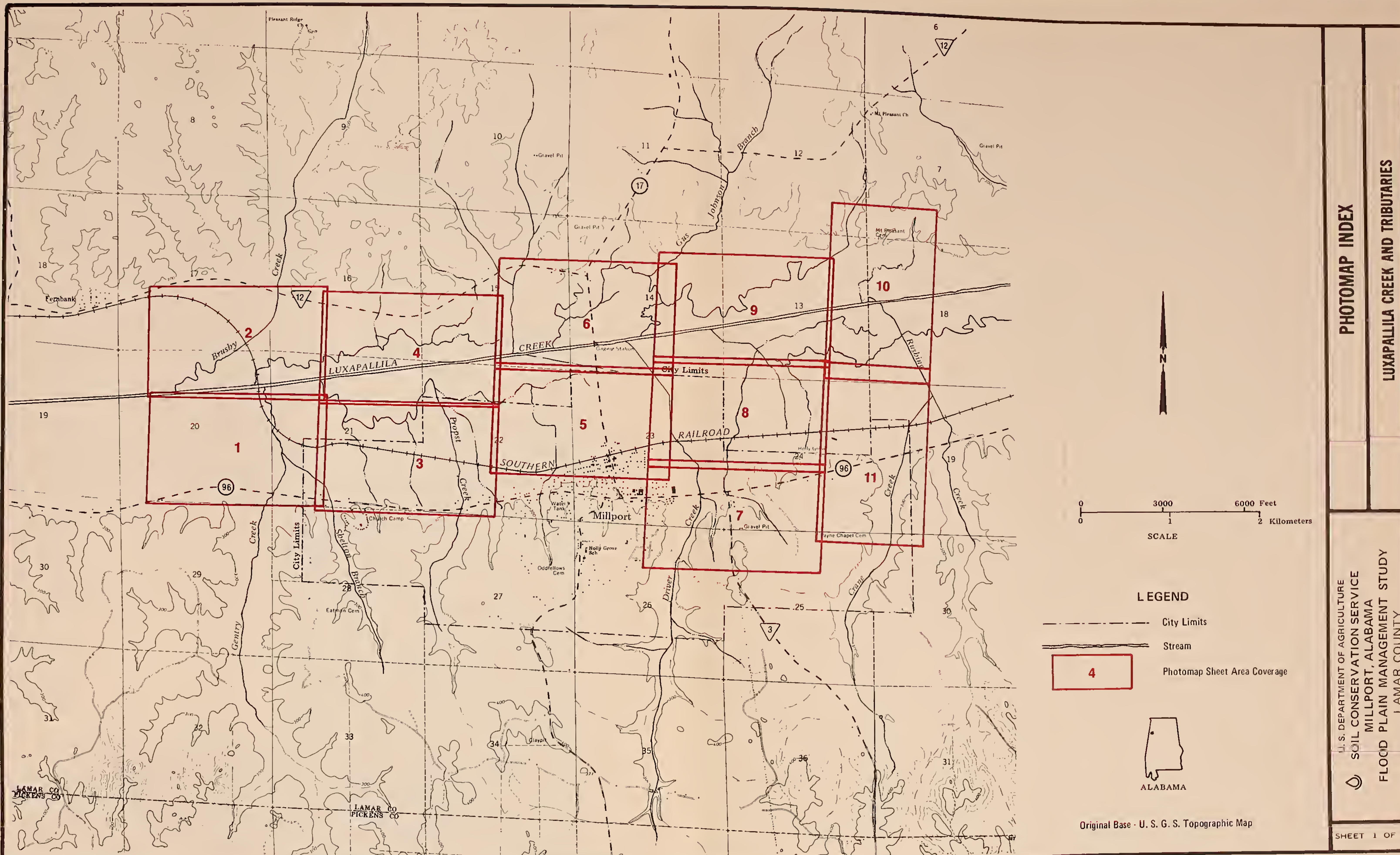
Public Information - The success of the Flood Plain Management Program will depend greatly upon the efforts made by local government to inform the public of the program. A public information program should be designed specifically to disseminate to all affected parties the essentials of the program, including code requirements, standards, and insurance provisions. Because the program affects not only future construction but also existing development, it is essential that property owners, land developers, real estate interests, construction interests, and lending institutions be acquainted with the flood plain management program and all of its implications. A knowledgeable and well-informed citizenry is the key to a successful flood plain management program.

Other Alternatives - Other alternatives, i.e., flood proofing existing structures, purchasing and relocating existing structures, and structural solutions to significantly reduce flooding were given only minimum consideration during the study. The frequency of flooding and the level of damagable values were not considered to be sufficient to justify these more costly alternatives.

APPENDIX A

PHOTOMAP INDEX

FLOOD HAZARD AREAS - SHEETS 1 THROUGH 11



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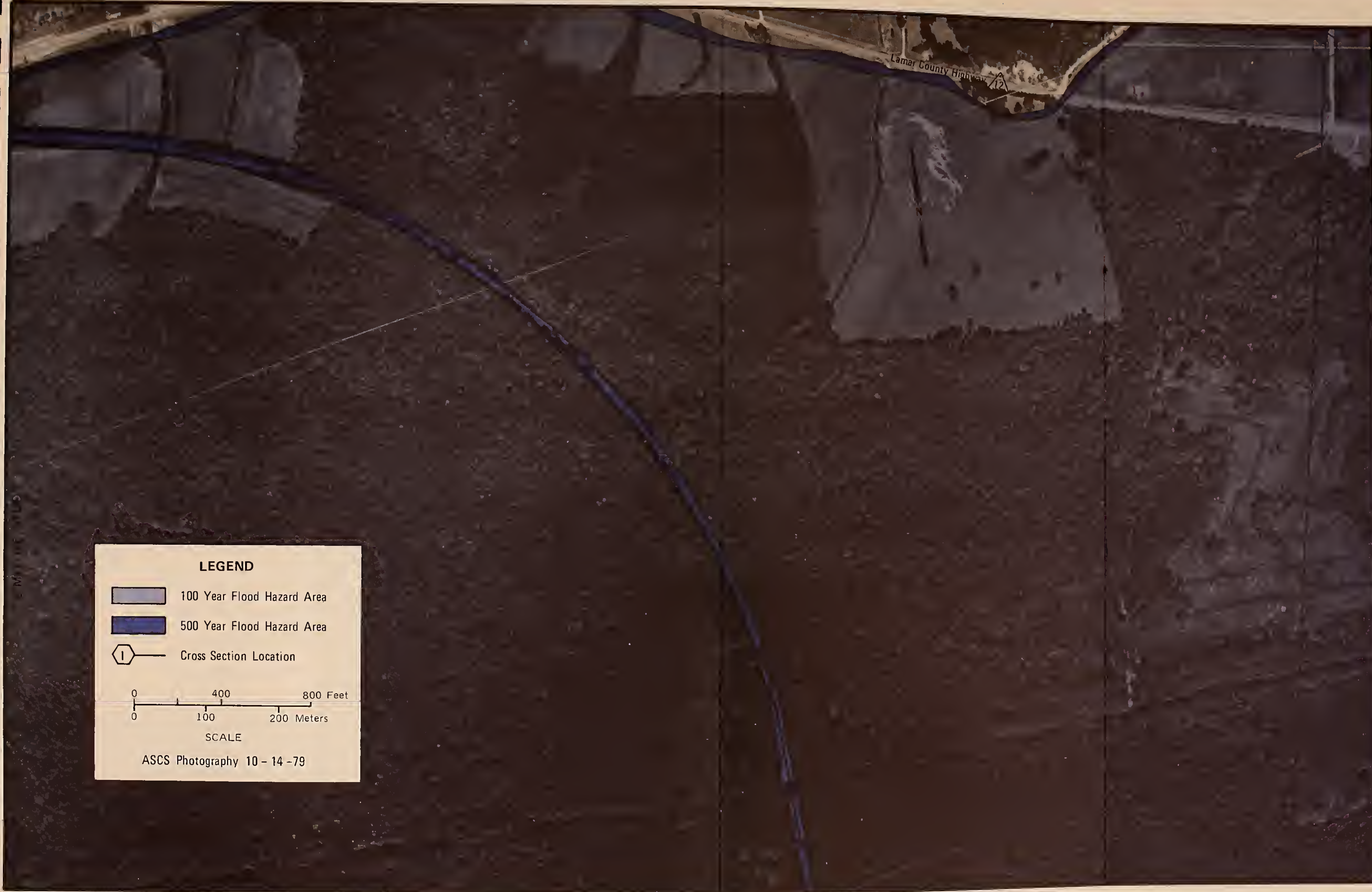
FLOOD HAZARD AREA
LUXAPALLILA CREEK AND TRIBUTARIES
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MILLPORT, ALABAMA
FLOOD PLAIN MANAGEMENT STUDY
LAMAR COUNTY
SHEET 1 OF 11
LEGEND
100 Year Flood Hazard Area
500 Year Flood Hazard Area
Cross Section Location
0
400
800 Feet
0
100
200 Meters
SCALE
ASCS Photography 10 - 14 - 79
Alabama Highway 96
N



FLOOD HAZARD AREA

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LAMAR COUNTY

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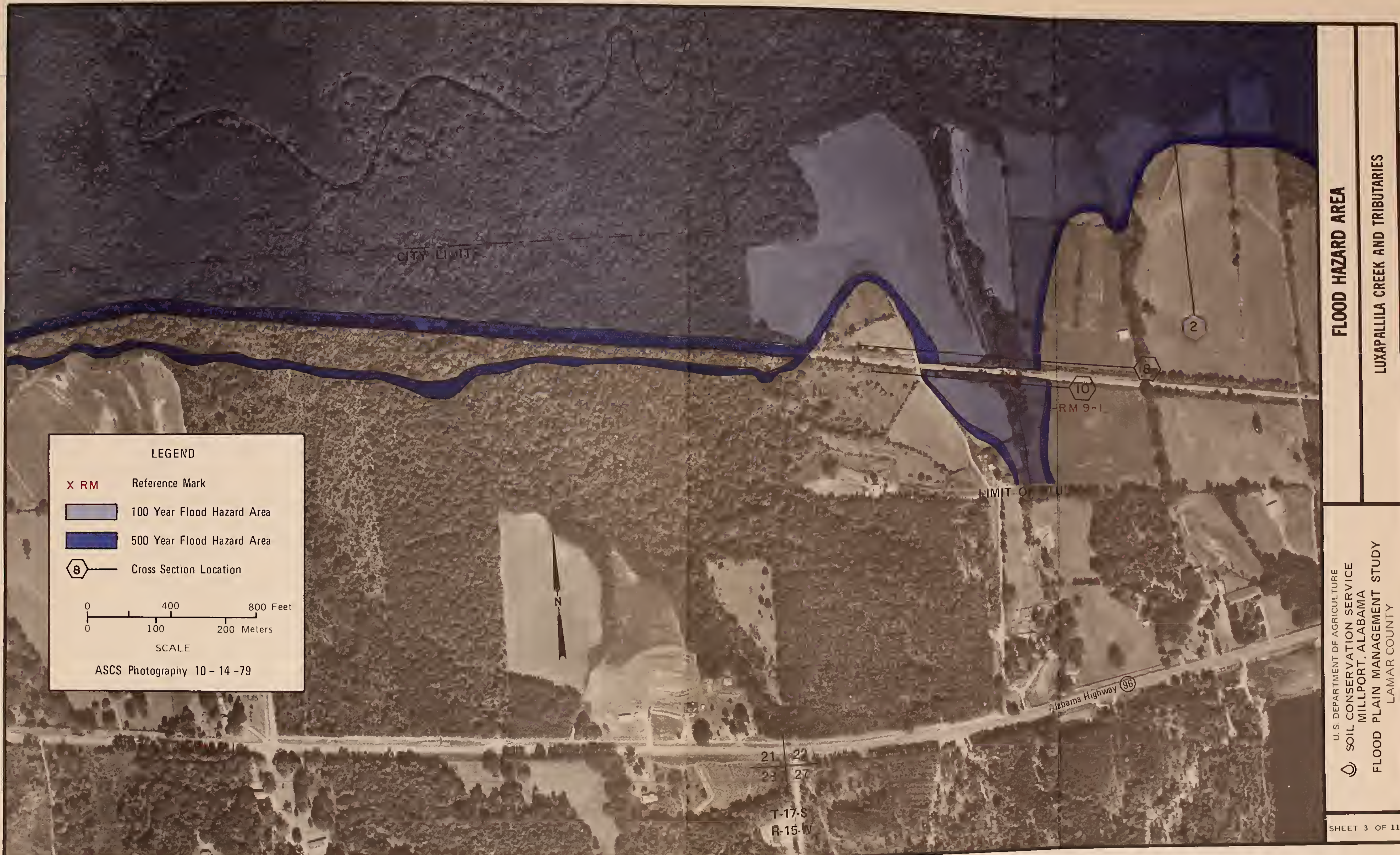

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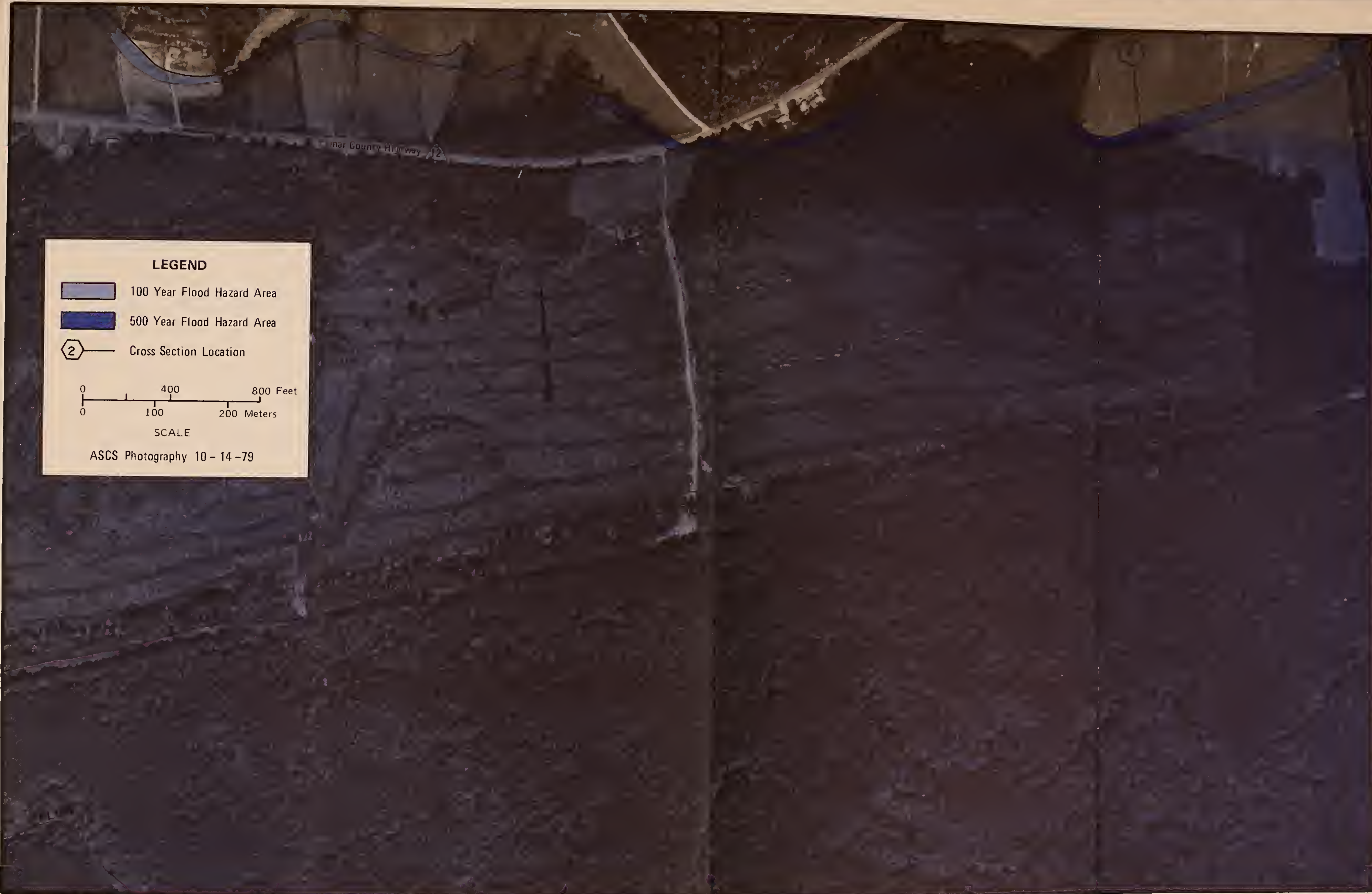

FLOOD HAZARD AREA

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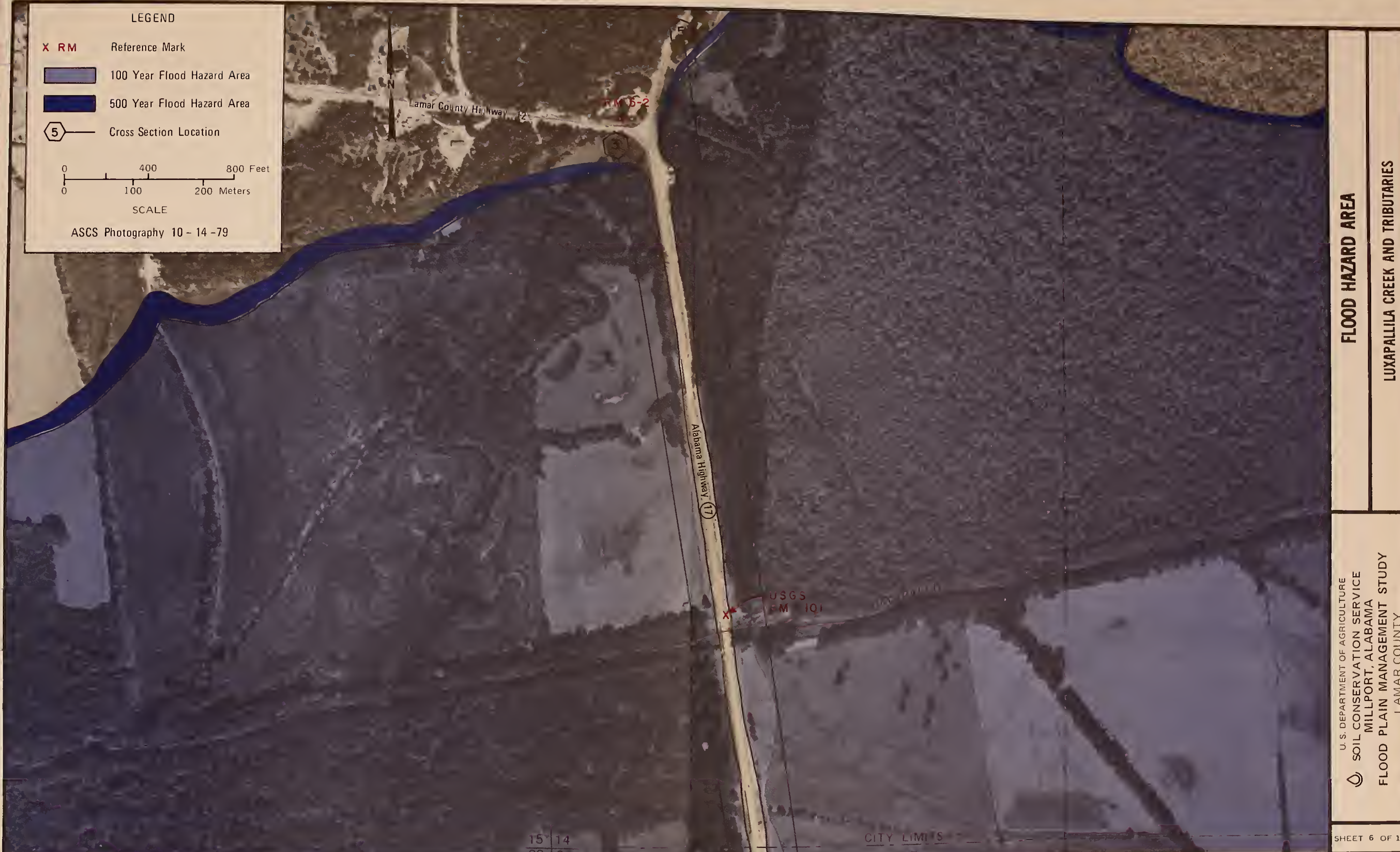

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SHEET 7 OF 11
LEGEND
X RM Reference Mark
100 Year Flood Hazard Area
500 Year Flood Hazard Area
15 Cross Section Location
0 400 800 Feet
0 100 200 Meters
SCALE
14
15
17
18
RM 16-1
To Fayette
Alabama Highway 96
Margrei St.
Elizabeth St.
Francis St.
Old Kennedy Road
Darr Road
23 24
26 25
T-17-S
R-15-W
N
Lamar County Highway 3
Alabama Power Company Transmission Line
LIMIT OF STUDY

USDA-SCS-FORT WORTH TEXAS 1981

FLOOD HAZARD AREA

LUXAPALLILA CREEK AND TRIBUTARIES

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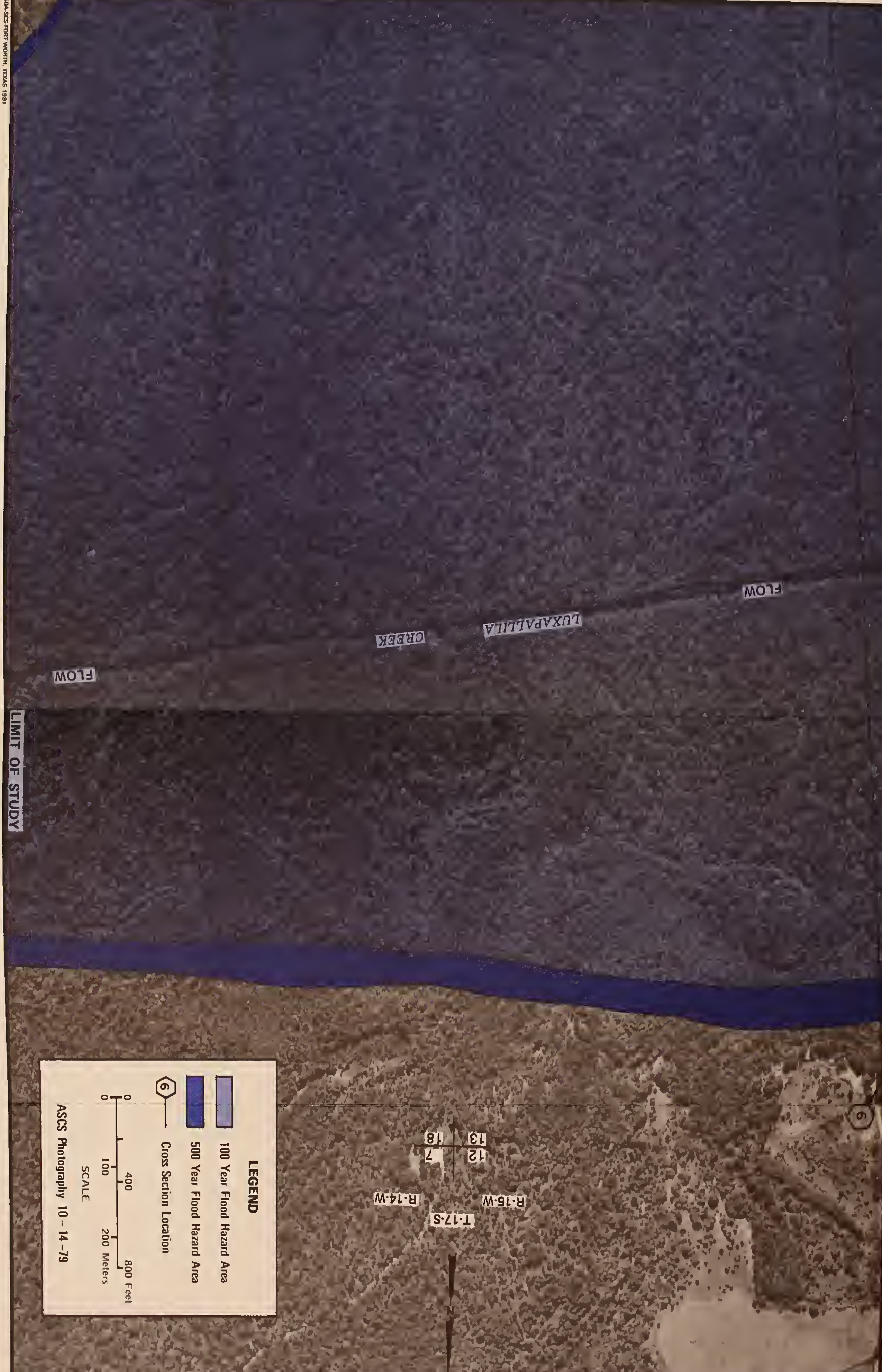
SOIL CONSERVATION SERVICE
MILLPORT, ALABAMA

FLOOD PLAIN MANAGEMENT STUDY
LAMAR COUNTY

SHEET 9 OF 11

DA-SCS-FORT WORTH, TEXAS 1981



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FLOOD PLAIN MANAGEMENT STUDY
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FLOOD HAZARD AREA

LUXAPALLILA CREEK AND TRIBUTARIES

SHEET 10 OF 11

USDA-SCS-FORT WORTH, TEXAS 1981

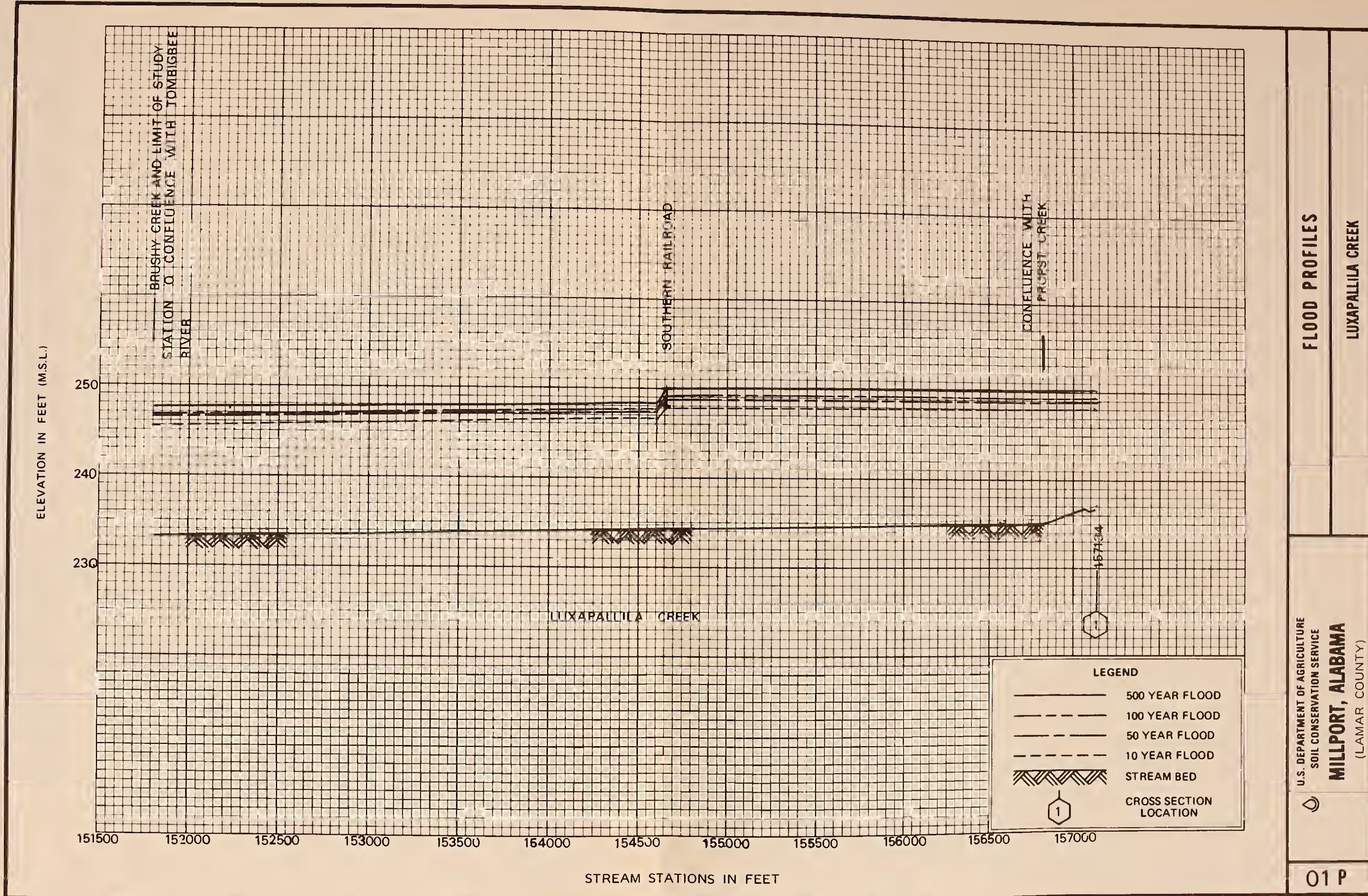

LEGEND
X RM Reference Mark
100 Year Flood Hazard Area
500 Year Flood Hazard Area
6 Cross Section Location
0 400 800 Feet
0 100 200 Meters
SCALE
ASCS Photography 10 - 14 -79
SOUTHERN RAILROAD
CITY LIMITS
Alabama Highway 96
N
6
R-15-W
R-14-W
T-17-S
13 18
24 19
25 30
FLOOD HAZARD AREA
LUXAPALLILA CREEK AND TRIBUTARIES
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MILLPORT, ALABAMA
FLOOD PLAIN MANAGEMENT STUDY
LAMAR COUNTY
SHEET 11 OF 11

APPENDIX B

FLOOD PROFILES

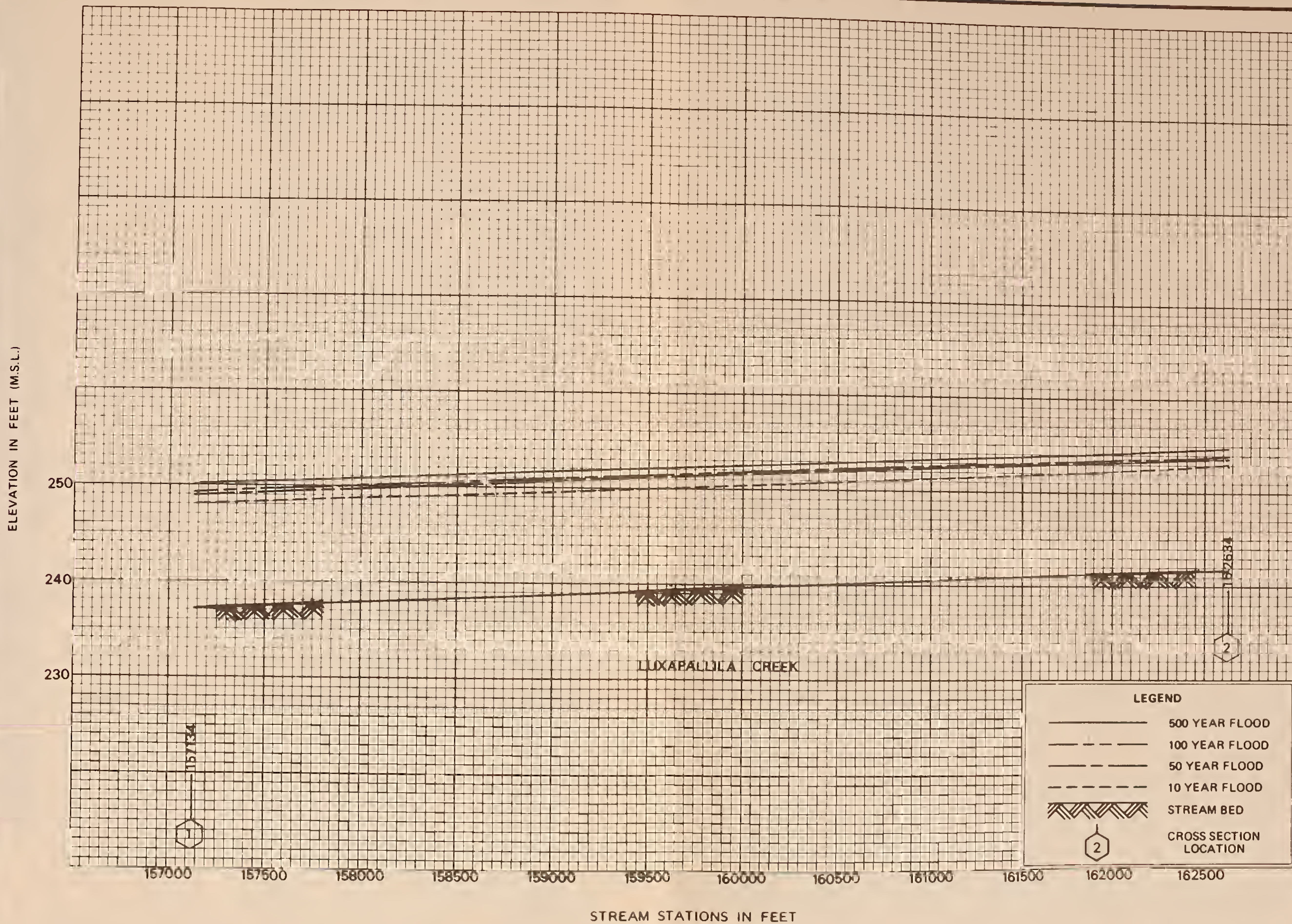
AND

TYPICAL VALLEY CROSS SECTIONS



STATION O BRUSHY CREEK AND LIMIT OF STUDY
CONFLUENCE WITH TOMBIGBEE RIVER
SOUTHERN RAILROAD
CONFLUENCE WITH PROPST CREEK
157134
LUXAPALLILA CREEK
ELEVATION IN FEET (M.S.L.)
250
240
230
STREAM STATIONS IN FEET
151500
152000
152500
153000
153500
154000
154500
155000
155500
156000
156500
157000
LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION
1
FLOOD PROFILES
LUXAPALLILA CREEK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MILLPORT, ALABAMA
(LAMAR COUNTY)
01 P

EXHIBIT 1



FLOOD PROFILES

LUXAPALLILA CREEK

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

MILLPORT, ALABAMA
(LAMAR COUNTY)

02 P

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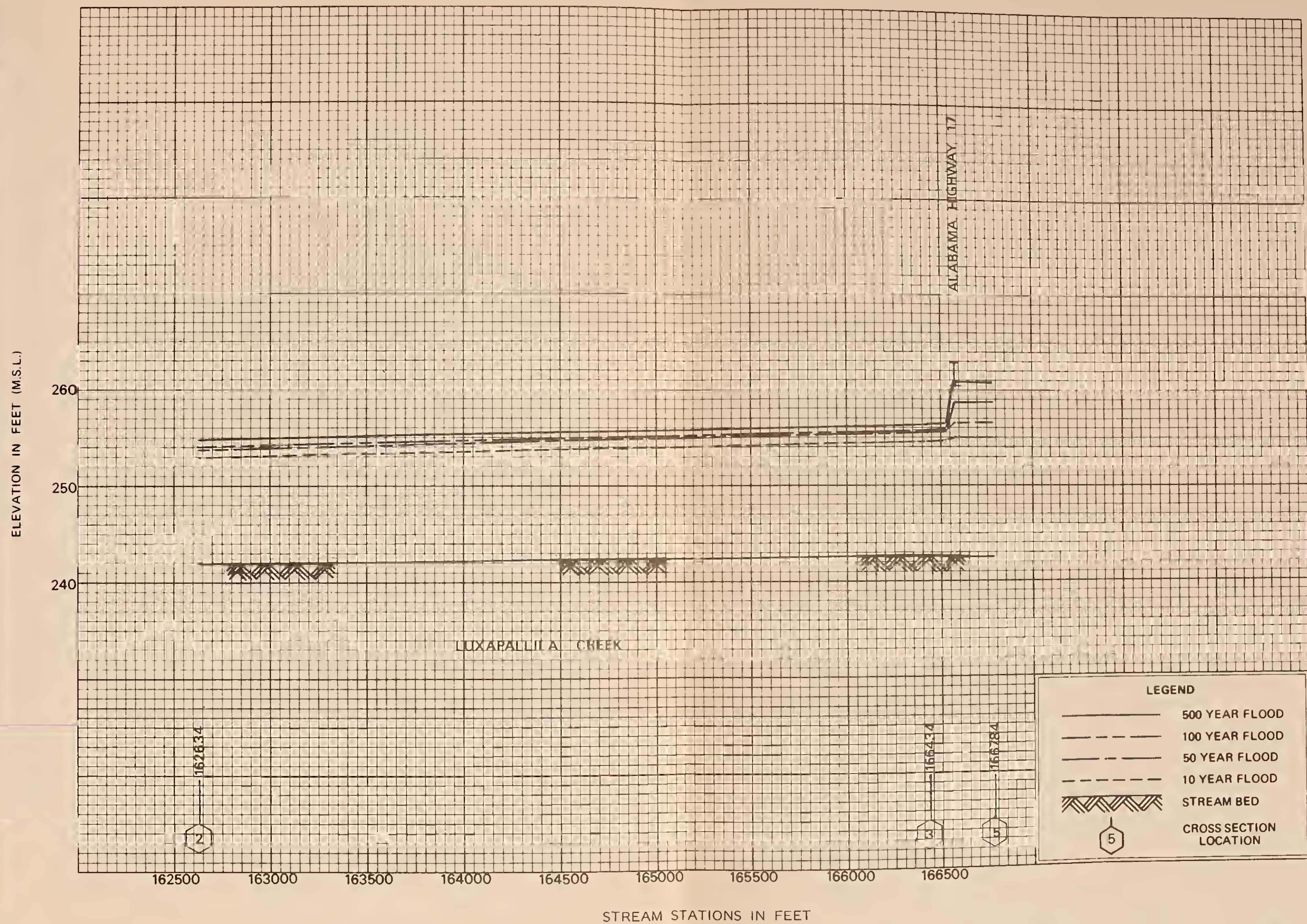


FLOOD PROFILES

LUXAPALLILA CREEK

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

MILLPORT, ALABAMA
(LAMAR COUNTY)

03 P

EXHIBIT 1

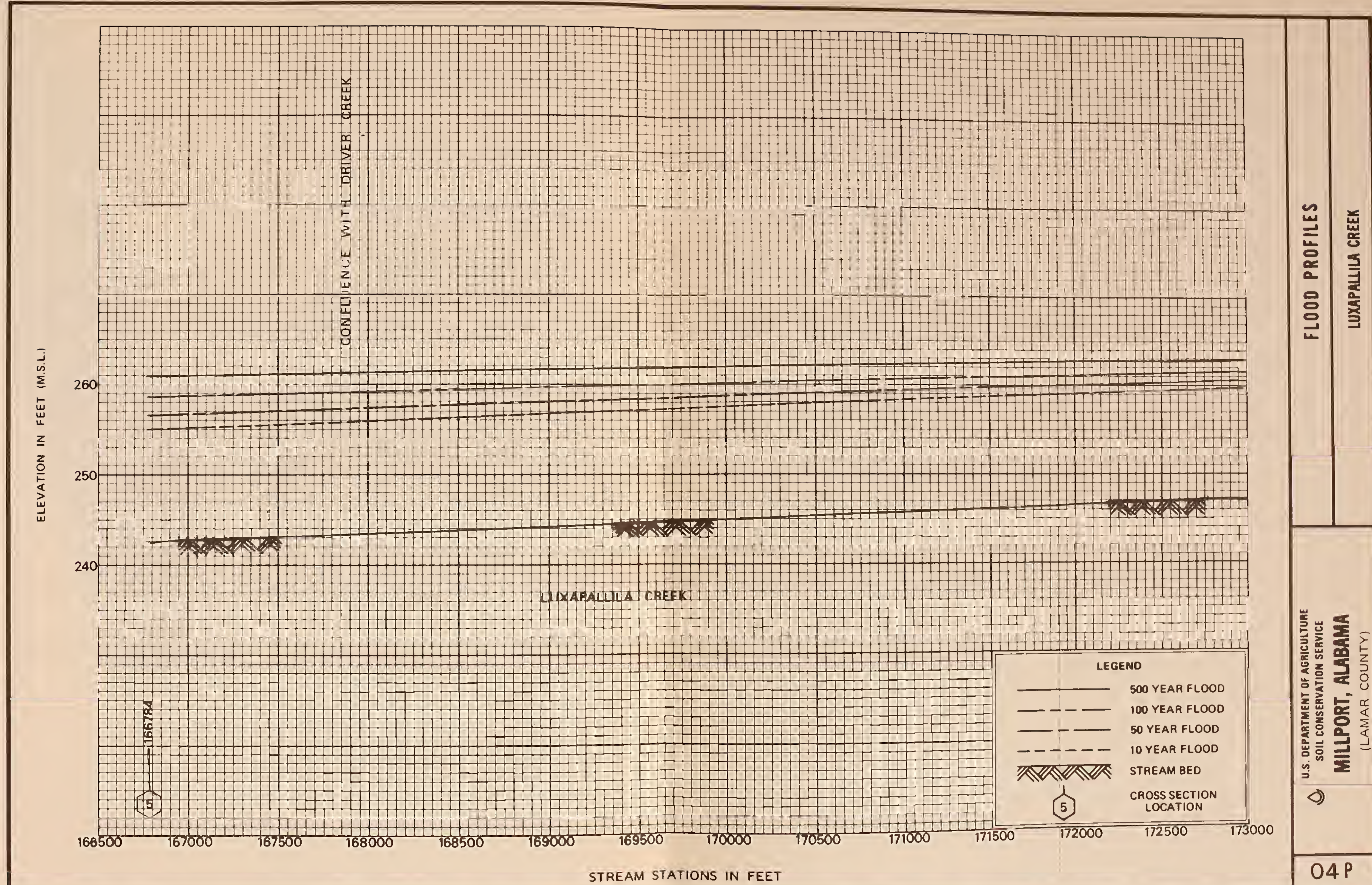
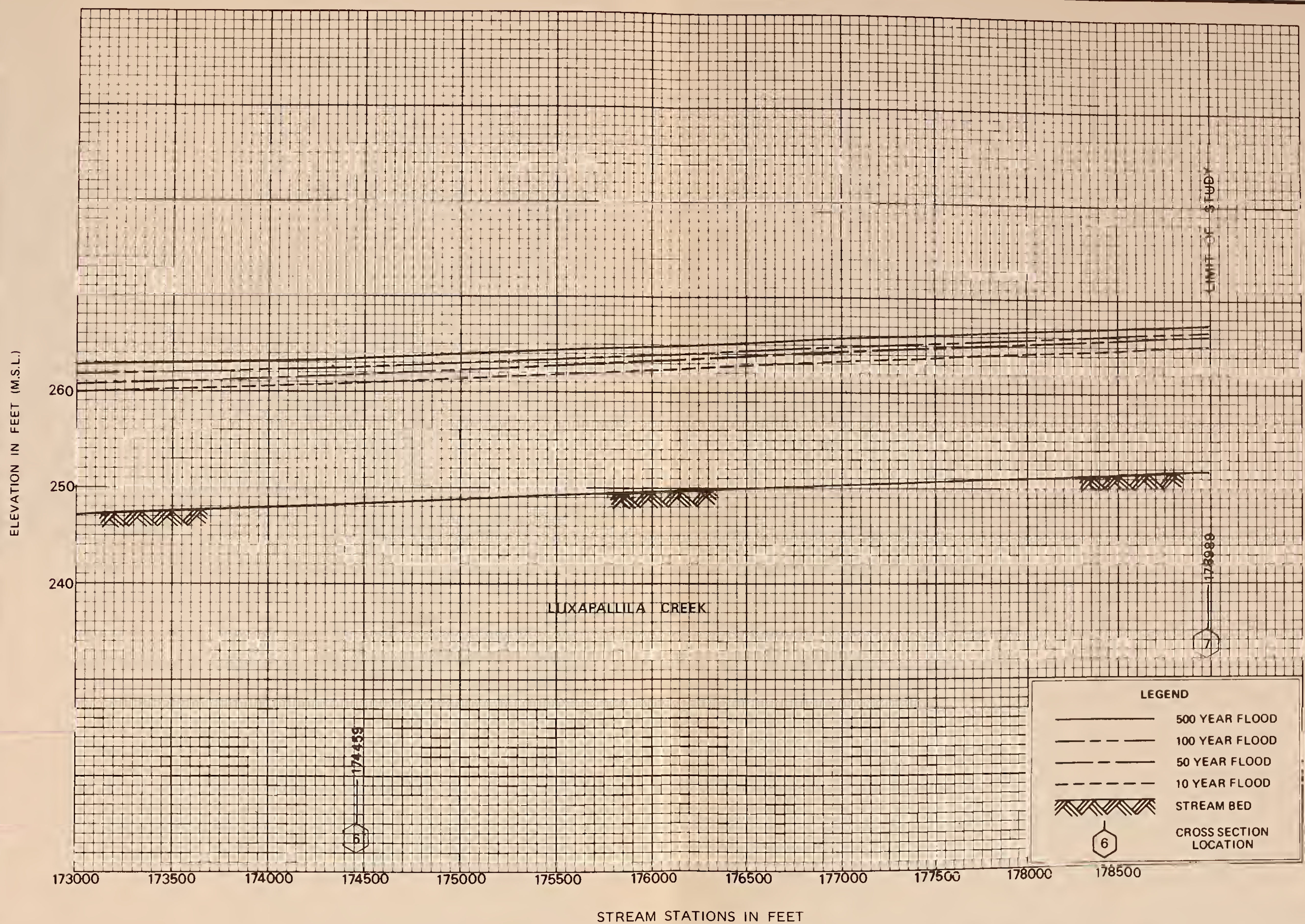

CONFLUENCE WITH DRIVER CREEK
ELEVATION IN FEET (M.S.L.)
260
250
240
LUXAPALLILA CREEK
166784
5
LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION
5
166500
167000
167500
168000
168500
169000
169500
170000
170500
171000
171500
172000
172500
173000
STREAM STATIONS IN FEET
FLOOD PROFILES
LUXAPALLILA CREEK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MILLPORT, ALABAMA
(LAMAR COUNTY)
04P

EXHIBIT 1



FLOOD PROFILES

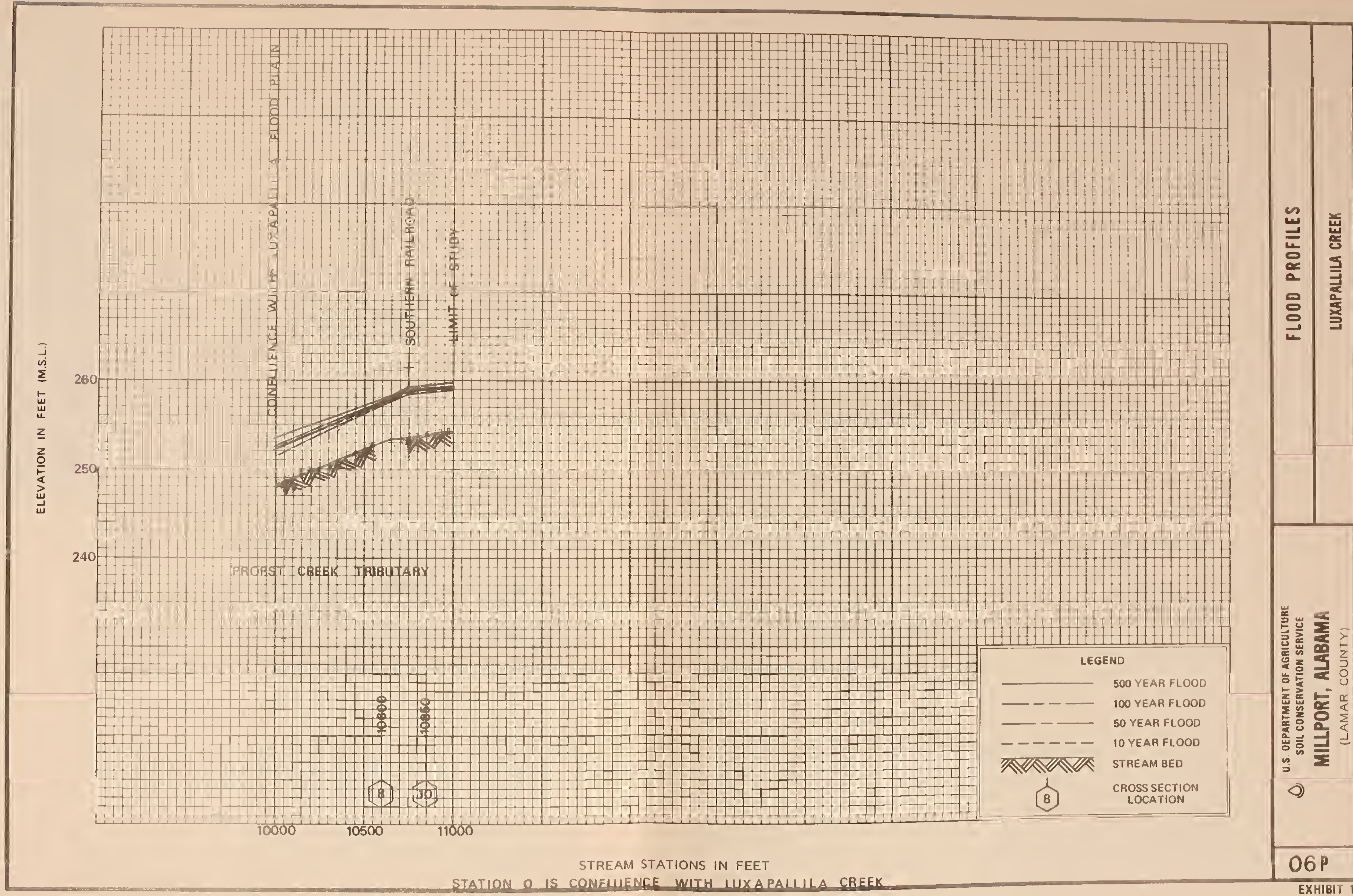
LUXAPALLILA CREEK

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

MILLPORT, ALABAMA
(LAMAR COUNTY)

05P

EXHIBIT 1



ELEVATION IN FEET (M.S.L.)
260
250
240
CONFLUENCE WITH LUXAPALLILA FLOOD PLAIN
SOUTHERN RAILROAD
LIMIT OF STUDY
PROBST CREEK TRIBUTARY
10600
10860
8
10
10000
10500
11000
STREAM STATIONS IN FEET
STATION 0 IS CONFLUENCE WITH LUXAPALLILA CREEK
LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
LUXAPALLILA CREEK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MILLPORT, ALABAMA
(LAMAR COUNTY)
06P
EXHIBIT 1

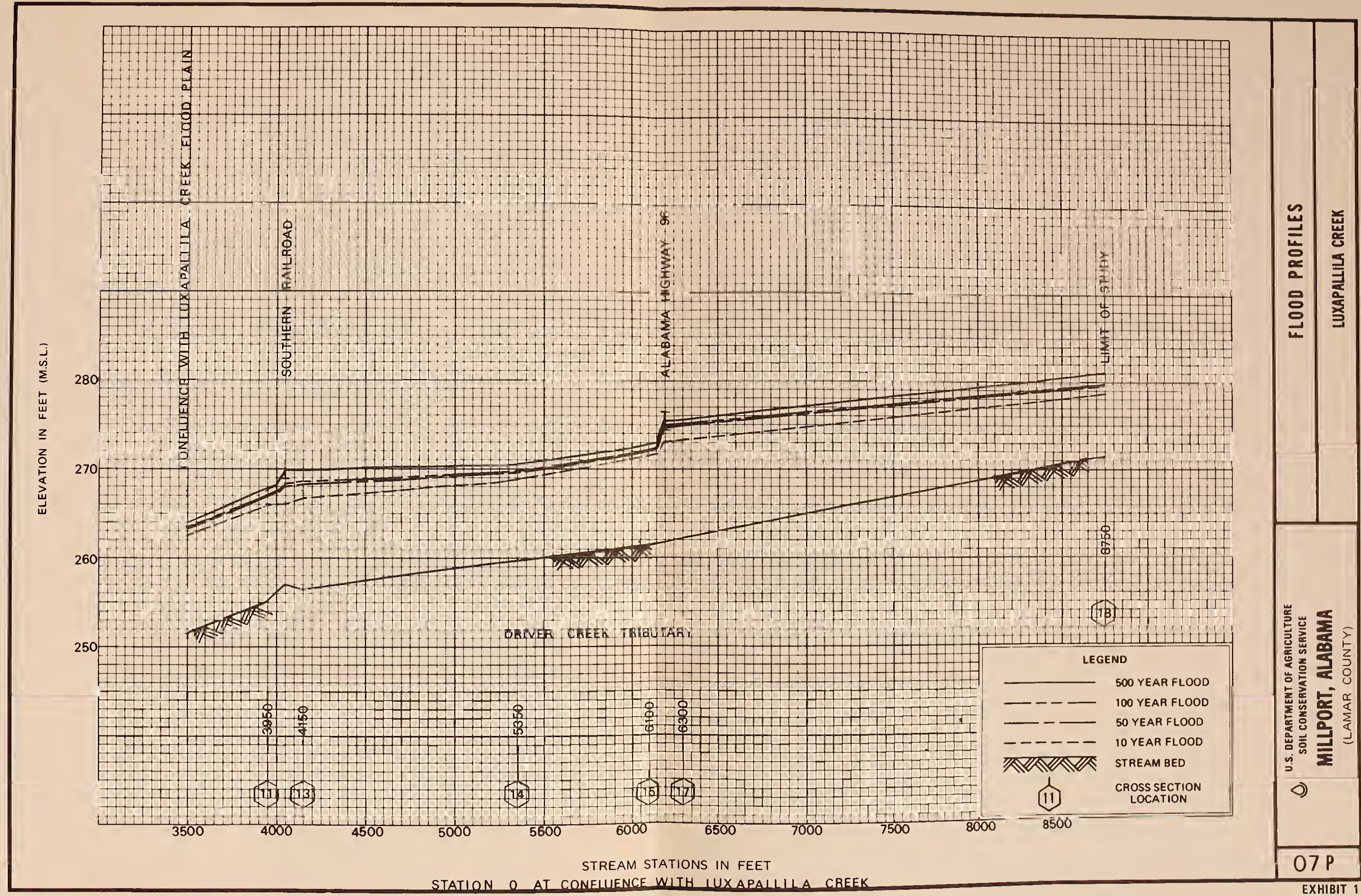
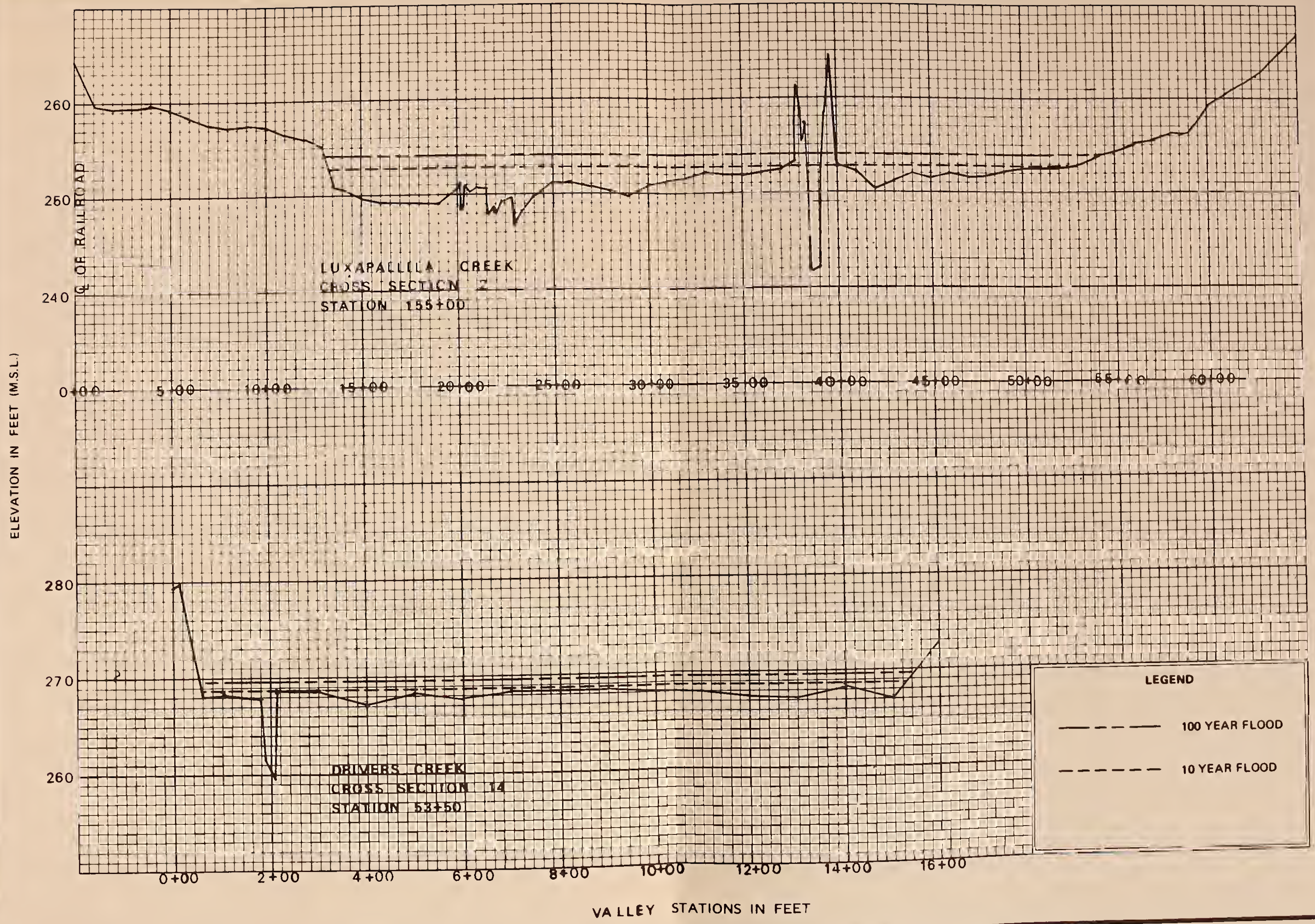

CONFLUENCE WITH LUXAPALLILA CREEK FLOOD PLAIN
SOUTHERN RAILROAD
ALABAMA HIGHWAY 96
LIMIT OF STUDY
ELEVATION IN FEET (M.S.L.)
280
270
260
250
DRIVER CREEK TRIBUTARY
3950
4150
5350
6100
6300
8750
11
13
14
15
17
18
LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
8500
STREAM STATIONS IN FEET
STATION 0 AT CONFLUENCE WITH LUXAPALLILA CREEK
FLOOD PROFILES
LUXAPALLILA CREEK
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MILLPORT, ALABAMA
(LAMAR COUNTY)
07P

EXHIBIT 1



TYPICAL VALLEY CROSS SECTION

LUXAPALLILA CREEK

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

MILLPORT, ALABAMA
(LAMAR COUNTY)

01C

EXHIBIT 1

APPENDIX C

TECHNICAL STUDY PROCEDURES

ELEVATION REFERENCE MARKS

DISCHARGE-ELEVATION-FREQUENCY DATA

FLOODWAY WIDTHS AND 100-YEAR

DISCHARGES AND VELOCITIES

GLOSSARY OF TERMS

REFERENCES CITED

TECHNICAL STUDY PROCEDURES

Hydrologic Data: Government agencies and town and county officials were contacted by SCS personnel during various phases of the study. The SCS field office in Vernon furnished land use data and other information used in this study.

The magnitude, in inches of rainfall, of the flood-producing storms used in determining runoff in the study area, are shown below:

Event (Frequency)	Storm Rainfall* (Inches in 24 Hrs.)
10-year	6.0
50-year	7.6
100-year	8.3
500-year	9.8**

* (U. S. Weather Bureau Publication TP-40)
** (Extrapolated from frequency curve)

Drainage areas were delineated and measured from U. S. Geological Survey 7½-minute topographic quadrangle sheets. 1/

The probability and magnitude of flooding are based on an analysis of rainfall and runoff characteristics correlated with regional flood characteristics as reflected by stream gage records.

A flood of 24-hour duration having an average frequency of occurrence in the order of once in 100 years (has a 1 percent chance of being equalled or exceeded in any given year) was selected to best reflect the present flooding problems. However, floods larger than the 100-year, 24-hour flood can, and have occurred in the study area. A flood larger and more severe than the maximum known flood will eventually occur. A 500-year frequency flood was used to show the effects of an extreme flood. The effect of a smaller flood (a flood that occurs more frequently) is shown by analysis of the 10-year flood which has a 10 percent chance of being equalled or exceeded in any given year.

Flow-frequency curves were developed from "Flood Frequency of Small Streams in Alabama", HPR No. 83, U. S. Geological Survey (1977) for drainage areas below 15 square miles and "Floods in Alabama, Magnitude and Frequency", U.S. Geological Survey (1973), for drainage areas above 15 square miles. [3/]

Surveys: Field surveys completed in 1979 included 14 stream channel and valley cross sections, 4 bridges and culvert sections, and 4 road profiles within the study area. Valley and channel cross sections were surveyed at selected locations to determine valley shape, width, and other hydraulic characteristics. Elevations of roads, bridges, culverts, and other control points were established. All of the surveys were referenced to mean sea level datum. The U. S. Geological Survey 7½-minute topographic quadrangle sheets (20-foot contour) were used for orientation. Aerial photographs, scale 1" = 400', taken in 1979 were used for base maps.

Hydraulic Analysis: Using data from field surveys and topographic maps, elevation-discharge relationships at each cross section were developed by computing water surface profiles of four flood frequencies (10-, 50-, 100-, and 500-year events). The modified-step method for open channel flow, as developed in the SCS-WSP-2 computer program, 5/ was used in these calculations. This program solves the head-loss due to roads, bridges and culverts using the U. S. Bureau of Public Roads method. In making computations, normal bridge flow conditions were assumed. The effects of blockage by trash and debris were not considered.

Valley and channel roughness coefficients were determined from field investigations as outlined in SCS, National Engineering Handbook Section 5, Supplement B. 2/ The roughness values ranged from 0.030 to 0.060 for the channels and from 0.040 to 0.055 for the overbank areas.

The effects of flood-prone area encroachment by the reduction of the floodway width was determined using the FLDWY (12-01-77) computer program developed by SCS. The program determines the floodway depth-width relationship at each valley cross section. The analysis was based on the assumption that the conveyance of the reduced section was equal to the conveyance of the original cross section and that each section was independent of upstream and downstream conditions. Equal conveyance loss on each side of the channel was assumed. The total flood plain flowage area was assumed to be reduced sufficiently to cause a maximum 1.0 foot increase in the 100-year flood elevations (see table 6, appendix C).

Preparation of Map and Profiles: Flood Hazard Area Photomaps, scale 1" = 400', were prepared by drawing the limits of the 100-year and 500-year floods on aerial photos (appendix A, sheets 1 through 11) to indicate the extent of the area subject to inundation. The photomaps are reproductions of ASCS photomaps taken in October 1979. The flood profiles were drawn at a scale of 1" = 500' (appendix B, sheet 01P-07P). The profile stationing is in terms of hundreds of feet and is measured from the aerial photographs.

Natural and Cultural Values: Natural and cultural values in the flood plain area were evaluated via on-site field reconnaissance conducted by the staff biologist and the local district conservationist. Qualitative observations were made along a line transit in the study area.

ELEVATION REFERENCE MARKS

(See Flood Hazard Areas)

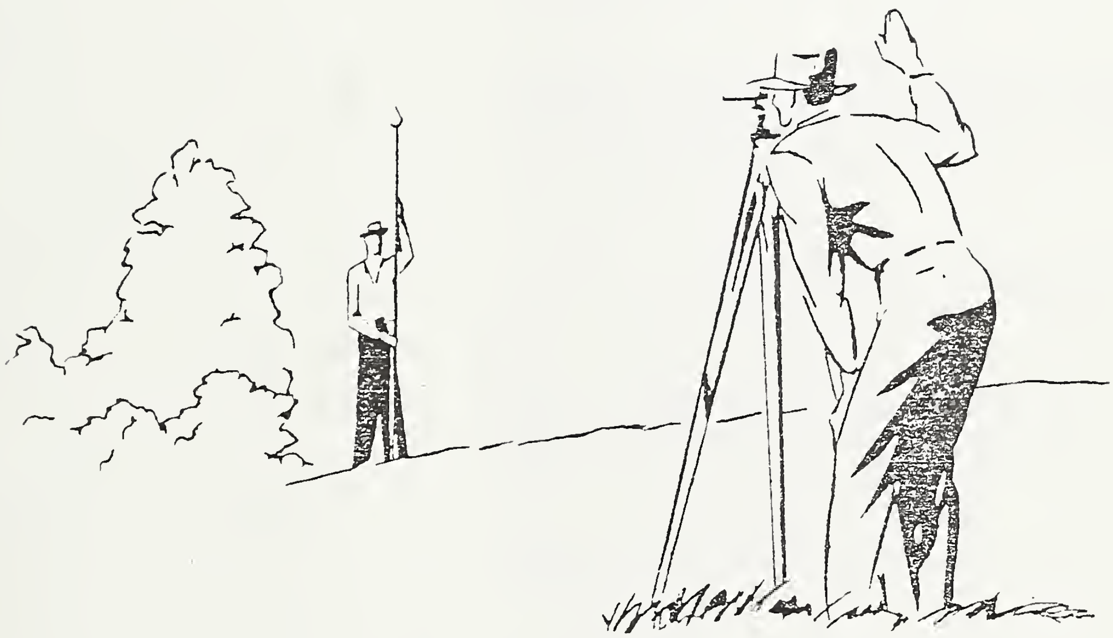


TABLE NO. 4

ELEVATION REFERENCE MARKS 1/

REFERENCE MARK	ELEVATION IN FEET (MSL)*	DESCRIPTION OF LOCATION
USGS BM E101	263.87	A standard disk, stamped E101 Reset 1953, 0.8 mile north along Alabama Highway 17 from the Southern Railroad Station in Millport, Lamar County, on a concrete bridge over Luxapallila Creek, and in the top of the northeast concrete abutment.
RM 5-2	258.51	Nails in the east side of a telephone pole at the intersection of Alabama Highway 17 and Lamar County Road 12, 1.2 miles north of Millport, AL.
RM 16-1	276.60	A chiseled square on the northwest corner of a bridge over Driver Creek. From the intersection of Alabama Highway 17 and 96 in Millport, go east on Alabama Highway 96 2700 feet to creek bridge and RM.
RM 12-1	268.87	A chiseled square on the northeast corner and on the west end of a railroad bridge over Driver Creek in the eastern part of Millport.
RM 7-2	272.50	From the Southern Railroad Station in Millport, go east along railroad about 2.0 miles to where Crane Creek crosses the railroad, cross nails in the southwest corner of the bridge.
RM 5-4	275.25	Nails in east side of power pole, 25 feet from corner of Gazette paper building in Millport, AL.
RM 1-1	270.41	A chiseled square on the south end of a box culvert 2.5 feet from the southeast corner of the culvert, and about 400 feet west of the entrance to church camp grounds on Alabama Highway 96 west of Millport, AL.
RM 9-1	258.62	A chiseled square on the southeast corner of the east end of the railroad bridge over Propst Creek, about 1.0 mile west of Millport, AL.

* Mean sea level (MSL)

1/ Locations designated on Flood Hazard Area Photomaps (Appendix A, sheets 1 through 11).

TABLE 5
DISCHARGE-ELEVATION FREQUENCY DATA

	Frequency	10-Year		50-Year		100-Year		500-Year	
Cross Section	Station	Elev. (MSL-Ft.)	Disch. (CFS)	Elev. (MSL-Ft.)	Disch. (CFS)	Elev. (MSL-Ft.)	Disch. (CFS)	Elev. (MSL-Ft.)	Disch. (CFS)
				Luxapallila Creek					
1	157134	248.0	12500	248.9	20500	249.2	24300	250.1	34600
2	162634	252.9	12400	253.7	20300	254.0	24100	254.8	34300
3	166434	254.6	12300	255.5	20100	255.8	23900	256.5	34000
5	166784	255.0	12300	256.7	20100	258.7	23900	260.9	34000
6	174459	260.9	11900	261.7	19500	262.4	23200	263.5	33000
7	178989	265.1	11700	266.1	19100	266.5	22700	267.4	32400
				Propst Creek					
8	10600	257.6	510	257.8	720	258.0	840	258.2	1100
10	10850	258.7	510	259.0	720	259.1	840	259.4	1100
				Driver Creek					
11	3950	266.0	1950	266.9	3250	267.0	3400	267.5	5100
13	4150	266.7	1950	268.2	3250	268.4	3400	270.0	5100
14	5350	268.8	1950	269.5	3200	269.7	3350	270.5	5050
15	6100	271.5	1900	272.1	3200	272.2	3300	272.9	4900
17	6300	273.2	1900	274.0	3200	275.0	3300	275.4	4900
18	8750	278.7	1800	279.7	2800	279.8	3200	281.0	4800

TABLE 6
FLOODWAY WIDTHS AND
PEAK DISCHARGE AND AVERAGE VELOCITIES, 100-YEAR FLOOD 1/

Cross Section	Station	Left (feet)	Right (feet)	Average Floodway Velocity (ft./sec.)	Discharge (CFS)
		Luxapallila Creek			
1	10000	1492	1611	2.17	24300
2	15500	1849	555	2.79	24100
3	19300	1013	1493	2.52	23900
6	27525	1772	794	2.16	23200
7	31855	1393	429	3.06	22700
		Driver Creek			
11	3950	120	148	3.28	3400
14	4150	50	661	1.68	3350
15	5350	19	174	4.27	3300
18	8750	57	31	6.04	3200

NOTE: 1/ This table shows the maximum allowable encroachment that will produce a 1.0 foot increase in the 100-year water surface elevation at the cross section. Any further reduction of floodway widths will increase the elevation of the water surface more than 1.0 foot. The reduction in floodway width is based on equal reduction in flood conveyance factors on both sides of the channel, where possible. Distances to the left and right are measured from the center of the main channel looking downstream.

GLOSSARY OF TERMS

Bridge Area--The effective hydraulic flow area of a bridge opening accounting for the presence of piers, attached conduits, and skew (alignment), if applicable.

Channel--A natural or artificial water course of perceptible extent with definite bed and banks to confine and conduct continuously or periodically flowing water.

Flood--"Flood" or "flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

(1) The overflow of inland or tidal waters and/or

(2) The unusual and rapid accumulation of runoff of surface waters from any source.

Flood Frequency--A means of expressing the probability of flood occurrences as determined from a statistical analysis of representative streamflow or rainfall and runoff records. It is customary to estimate the frequency with which specific flood stages or discharges may be equalled or exceeded, rather than the frequency of an exact stage or discharge. Such estimates by strict definition are designated "exceedence frequence", but in practice the term "frequency" is used. The frequency of a particular stage or discharge is usually expressed as occurring once in a specified number of years. Also see definition of "recurrence interval." For example -

A 100-year flood is one having an average frequency of occurence in the order of once in 100 years. It has a 1 percent chance of being equalled or exceeded in any given year. It is based on statistical analyses of streamflow records available for the watershed and analyses of rainfall and runoff characteristics in the general region of the watershed.

Flood Hazard Area--Synonymous with Flood Plain (general). Used in FEMA National Flood Insurance Program. Commonly used in reference to flood map.

Flood Peak--The highest stage or discharge attained during a flood event; also referred to as peak stage or peak discharge.

Flood Plain (general)--The relatively flat area or low lands adjoining the channel of a river, stream, or watercourse; ocean, lake, or other body of standing water which has been or may be covered by floodwater.

Floodway Fringe--The portion of the flood plain beyond the limits of the floodway. Flood waters in this area are usually shallow and slow moving. (See Figure 2, page 16)

Flood Plain (specific)--A definitive area within a flood plain (general) or flood-prone area known to have been inundated by a historical flood, or determined to be inundated by floodwater from a potential flood of a specified frequency.

Flood Prone Area--Synonymous with Flood Plain (general). Used in Alabama land management and use law.

Flood Profile--A graph showing the relationship of water surface elevation to stream channel location. It is generally drawn to show the water surface to elevation for the peak of a specific flood, but may be prepared for conditions at a given time or stage.

Flood Stage--The elevation of the overflow above the natural banks of a stream or body of water. Sometimes referred to as the elevation and the flood peak elevation measures for a specific storage area.

Floodway--The channel of the stream and adjacent portions of the flood plain designated to carry the flow of the design flood. In Alabama this is the 100-year frequency flood.

High Water Mark (HWM)--The maximum observed and recorded height or elevation that floodwater reaches during a storm, usually associated with the flood peak. The high water mark may be referenced to a particular building, bridge, or other landmark, or based on debris deposits on bridges, fences, or other evidence of the flood.

Low Bank--The highest elevation at a specific stream channel cross section at which the flow in the stream can be contained in the channel without overflowing into adjacent overbank areas.

Low Point on Roadway--The lowest elevation on a road profile usually in the vicinity of where the road crosses the stream. It is the first point on the roadway to be flooded.

Potential Flood--A spontaneous event (natural phenomenon) capable of occurring from a combination of meterological, hydrological, and physical conditions; the magnitude of which is dependent upon specific combinations. See Flood and Flood Frequency.

Recurrence Interval--The average interval of time expected to elapse between floods of a particular severity based on stage or discharge. Recurrence interval is generally expressed in years and is determined statistically from actual or representative streamflows. Also see definition of Flood Frequency.

Roadway at Crossing (Top)--The elevation of the roadway immediately above the stream channel. It may be higher than the low point of the roadway.

Runoff--That part of precipitation which flows across the land and enters a perennial or intermittent stream.

Stream Channel--A natural or artificial watercourse of perceptible extent, with definite bed and banks to confine and conduct continuously or periodically flowing water.

Stream Channel Bottom--The lowest part of the stream channel (either in a constructed cross section or a natural channel). Bottom may be plotted and connected to provide a stream bottom profile.

Stream Channel Flow--That water which is flowing within the limits of a defined watercourse.

Stream Terrace--A flat or undulating plain bordering a floodplain. Terraces normally occur at higher elevations than floodplains and usually are either free from flooding or flooded less often than once every two years.

Structural Bottom of Opening--The lowest point of a culvert or bridge opening with a constructed bottom through which a stream flows that could tend to limit the stream channel bottom to that specific elevation. This structural bottom may be covered with sediment or debris which further restricts the size of the opening.

Theoretical Floodway--The adjusted portion of the 100-year flood plain allowing for an acceptable increase in the 100-year flood depth, no building or fill permitted.

Top of Opening--The lowest point of a bridge, culvert or other structure over a river, stream or watercourse that limits the height of the opening through which water flows. This is referred to as "low steel" or "low chord" in some regions.

Watershed--A drainage basin or area which collects and transmit runoff usually by means of streams and tributaries to the outlet of the basin.

Watershed Boundary--The divide separating one drainage basin from another.

REFERENCES CITED

1/ U. S. Geological Survey 7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 feet: Millport, Alabama (1967).

2/ U. S. Department of Agriculture, Soil Conservation Service, National Engineering Handbook Section 4, Hydrology, Section 5 Hydraulics.

3/ U. S. Geological Survey, "Flood Frequency of Small Streams in Alabama", HPR 83, 1977, D. A. Olin and R. H. Bingham and "Floods in Alabama", 1973, Charles F. Hains, U. S. Department of Interior, Geological Survey, University, Alabama.

4/ U. S. Department of Agriculture, Soil Conservation Service, TP-149, "Peak Rates of Discharge for Small Watersheds", April 1973 and U. S. Department of Agriculture, Soil Conservation Service, TR-No. 55, "Urban Hydrology for Small Watersheds", January 1975.

5/ U. S. Department of Agriculture, Soil Conservation Service, TR-No. 61, "WSP-2 Computer Program," May 1976.

6/ U. S. Water Resources Council "Regulation of Flood Hazard Areas to reduce flood losses," Vols. I and II, 1971-1972.

7/ U. S. Army Corps of Engineers, "Flood Proofing Regulations," June 1972.

8/ U. S. Army Corps of Engineers, " A Perspective on Flood Plain Regulations for Flood Plain Management," June 1976.

SOIL CONSERVATION SERVICE